IN THE CLAIMS:

1. (currently amended) A computed tomographic (CT) imaging system for performing a CT scan, said CT system comprising:

an x-ray source;

a detector array comprising a plurality of detector cells;

a gantry for rotating said x-ray source and said detector array;

a table for translating a patient; and

a processor operationally coupled to said detector array, said processor configured to:

receive first data regarding a first x-ray spectral range from a first detector cell from a scan with an x-ray source pitch of one detector cell such that the x-ray source advances relative to the table one detector cell per revolution;

receive second data regarding a second x-ray spectral range different from the first x-ray spectral range from a second detector cell different from the first detector cell; and

determine spectral information from the first data and the second data.

2. (previously presented) A CT system in accordance with Claim 1 wherein said CT system further comprises an x-ray tube, said tube configured to produce a spatially variant x-ray energy distribution in a Z direction.

3. (previously presented) A CT system in accordance with Claim 1 wherein said CT system further comprises an x-ray tube on a rotating gantry, said x-ray tube configured to emit x-rays at a first x-ray spectral range and a second x-ray spectral range different from the first x-ray spectral range during the rotation of said gantry during a single data acquisition.

4. (previously presented) A CT system in accordance with Claim 1 wherein said CT system further comprises:

an x-ray source positioned to emit x-rays toward said detector array; and

at least one x-ray energy filter positioned between said source and said detector array.

5. (previously presented) A CT system in accordance with Claim 4 wherein said x-ray energy filter is positioned between said x-ray source and an object being imaged.

6. (previously presented) A CT system in accordance with Claim 4 wherein said x-ray energy filter is positioned in an x-ray collimator between said x-ray source and an object being imaged.

7. (previously presented) A CT system in accordance with Claim 4 wherein said x-ray energy filter is positioned between an object being imaged and said detector array.

8. (previously presented) A CT system in accordance with Claim 4 wherein said x-ray energy filter comprises a plurality of discrete filter elements separated by intervening air paths and oriented in a Z direction.

9. (previously presented) A CT system in accordance with Claim 4 wherein said x-ray energy filter comprises a variable filter.

10. (previously presented) A CT system in accordance with Claim 8 wherein said discrete filter elements each have substantially the same x-ray absorption property.

11. (previously presented) A CT system in accordance with Claim 8 wherein one of said discrete filter elements has a first x-ray absorption property and one of said discrete filter elements has a second x-ray absorption property different from the first.

12. (previously presented) A CT system in accordance with Claim 4 wherein said x-ray energy filter comprises at least one of a stepped filter, a sloped filter, a plurality of K edge filters, and a set of paired K edge filters in a Z-axis direction.

13. (previously presented) A CT system in accordance with Claim 1 further comprising an x-ray source outputting a single x-ray spectrum wherein said first detector cell detects a different x-ray subspectrum than said second detector cell.

14. (previously presented) A method for scanning an object, said scanning comprises scanning an object by at least one of:

scanning the object with an x-ray source pitch of one detector cell such that the x-ray source advances one detector cell per revolution and while varying a peak kiloelectronvolt to an x-ray tube;

scanning the object with an x-ray pitch of one detector cell and with a filter such that a plurality of x-ray spectra are received by a detector array; and

scanning the object with an x-ray source pitch of one detector cell such that the x-ray source advances one detector cell per revolution and such that elements of a detector array discriminate between a plurality of x-ray spectra and generate signals based on the x-ray spectra.

15. (previously presented) A method for determining the presence of an analyte in an object with a computed tomographic (CT) imaging system, said method comprising:

receiving first data regarding a first x-ray spectral range from a first detector cell from a scan with an x-ray source pitch of one detector cell such that the x-ray source advances one detector cell per revolution;

receiving second data regarding a second x-ray spectral range different from the first x-ray spectral range from a second detector cell different from the first detector cell; and

determining spectral information from the first data and the second data.

16. (presently amended) A computed tomographic (CT) imaging system for performing a CT scan, said CT system comprising:

a detector array comprising a plurality of detector cells;

an x-ray source positioned to emit x-rays toward said detector array; ~~and~~

a gantry for rotating the x-ray source and said detector array;

a table for translating a patent; and

a processor operationally coupled to said detector array, said processor configured to:

receive first data regarding a first x-ray spectral range from a first detector cell from a scan with an x-ray source pitch of one detector cell such that the x-ray source advances relative to the table one detector cell per revolution;

receive second data regarding a second x-ray spectral range different from the first x-ray spectral range from a second detector cell different from the first detector cell; and

determine spectral information from the first data and the second data.

17. (previously presented) A CT system in accordance with Claim 16 wherein said x-ray source comprises an x-ray tube configured to produce a spatially variant x-ray energy distribution in a Z direction.

18. (previously presented) A CT system in accordance with Claim 16 further comprising a rotating gantry, said x-ray source configured to emit x-rays at a first x-ray spectral range and a second x-ray spectral range different from the first x-ray spectral range during the rotation of said gantry during a single data acquisition.

19. (previously presented) A CT system in accordance with Claim 16 further comprising a plurality of x-ray energy filter elements separated by intervening air paths and oriented in a Z direction.

20. (previously presented) A CT system in accordance with Claim 19 wherein at least one said x-ray energy filter is positioned between said x-ray source and an object being imaged.

21. (previously presented) A CT system in accordance with Claim 19 wherein at least one said x-ray energy filter is positioned between said detector and an object being imaged.

22. (previously presented) A CT system in accordance with Claim 19 wherein said discrete filter elements each have substantially the same x-ray absorption property.

23. (previously presented) A CT system in accordance with Claim 19 wherein one of said discrete filter elements has a first x-ray absorption property and one of said discrete filter elements has a second x-ray absorption property different from the first.

24. (previously presented) A computed tomographic (CT) imaging system for performing a CT scan, said CT system comprising:

a detector array comprising a plurality of detector cells;

a processor operationally coupled to said detector array, said processor configured to:

receive first data regarding a first x-ray spectral range from a first detector cell of a first detector row receiving filtered x-ray beam data at a first Z location;

receive second data regarding a second x-ray spectral range different from the first x-ray spectral range from a second detector cell of a second detector row receiving unfiltered x-ray beam data at a second Z location, the second row not adjacent the first row; and

determine spectral information from the first data and the second data.

25. (previously presented) A CT system in accordance with Claim 24 wherein said processor further configured to receive third data regarding a third x-ray spectral range from a third detector cell of a third detector row receiving filtered x-ray beam data differently than the first row at a third Z location.

26. (previously presented) A computed tomographic (CT) imaging system for performing a CT scan, said CT system comprising:

a detector array comprising a plurality of detector cells arranged in a plurality of detector rows;

an x-ray source positioned to emit x-rays toward said detector array; and

a filter positioned between said array and said source such that a first detector row receives filtered x-ray beam data while a second detector row not adjacent said first detector row receives filtered x-ray beam data filtered differently than said first row.

27. (previously presented) A CT system in accordance with Claim 26 wherein said filter comprises a plurality of discrete filter elements with different x-ray absorption properties.

28. (previously presented) A CT system in accordance with Claim 26 wherein said filter comprises a single sloped filter.